

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

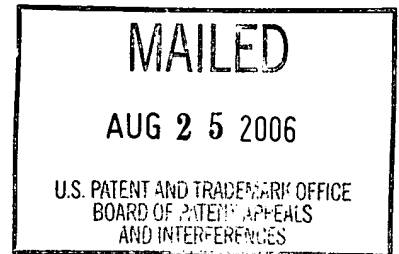
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOO SOO LIM & IN BYEONG KANG

Appeal No. 2006-1628
Application No. 09/840,082

ON BRIEF



Before JERRY SMITH, BARRY, and SAADAT, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-3, 5-7, 9, 11-13, 15-17, 19, and 21, which constitute all the claims pending in this application.

The disclosed invention pertains to a liquid crystal display device with a pixel electrode between a gate line and a data line with a switching device therebetween and a charging device on the gate line. A light-shielding member overlaps the switching device and extends from an end at the pixel electrode side of a metal thin film provided with the switching device into the pixel area. A light-

shielding member also overlaps the metal thin film upper electrode of the charging device. As a result, light is blocked from the metal thin films of the switching device and charging device thus preventing undesired reflections that would otherwise degrade image quality.

Representative claim 1 is reproduced as follows:

A liquid crystal display device comprising:

a pixel electrode at a pixel area between a gate line and a data line;

a switching device at an intersection between the gate line and the data line, the switching device comprising a light-shielding member overlapping the switching device and extending from an end at the pixel electrode side of a metal thin film provided within the switching device into the pixel area, the light shielding member covering and extending past all sides of the metal thin film with a margin sufficient to block light incident on the metal thin film, wherein the switching device is a thin film transistor at the intersection between the gate line and the data line for driving the pixel electrode, and wherein the metal thin film of the switching device is a drain electrode connected to the pixel electrode.

The examiner relies on the following references:

Yanagawa et al. (Yanagawa)	6,266,117	Jul. 24, 2001 (filed Mar. 2, 1998)
Murade	6,297,862	Oct. 2, 2001 (filed Jun. 12, 1998)

The admitted prior art shown in Figs. 1-3 of the application.

The following rejections are on appeal before us:

1. Claims 1-3, 5-7, 9, 11-13, 15-17, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Murade.

2. Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Murade and further in view of Yanagawa.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in the claims on appeal. Accordingly, we affirm.

We first consider the examiner's rejection of claims 1-3, 5-7, 9, 11-13, 15-17, and 19 under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Murade. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d

1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). The examiner must articulate reasons for the examiner's decision. In re Lee, 277 F.3d 1338, 1342, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). In particular, the examiner must show that there is a teaching, motivation, or suggestion of a motivation to combine references relied on as evidence of obviousness. Id. at 1343. The examiner cannot simply reach conclusions based on the examiner's own understanding or experience - or on his or her assessment of what would be basic knowledge or common sense. Rather, the examiner must point to some concrete evidence in the record in support of these findings. In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Thus the examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the examiner's conclusion. However, a suggestion, teaching, or motivation to combine the relevant prior art teachings does not have to be found explicitly in the prior art, as the teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. In re Kahn, 441 F.3d 977, 987-88, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) citing In re Kotzab, 217 F.3d 1365, 1370,

55 USPQ2d 1313 (Fed. Cir. 2000). See also In re Thrift, 298 F. 3d 1357, 1363, 63 USPQ2d 2002, 2008 (Fed. Cir. 2002). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the briefs have not been considered and are deemed to be waived [see 37 CFR § 41.37(c)(1)(vii)(2004)].

Regarding independent claims 1, 5, 9, 11, 15, and 19, the examiner's rejection essentially finds that the admitted prior art teaches every claimed feature except for the light-shielding member (1) extending from an end at the pixel electrode side of a drain electrode of the thin film transistor (TFT), and (2) extending from an end at the pixel electrode side of the storage capacitor upper electrode (metal thin film) into the pixel area. The examiner also indicates that the claims differ from the admitted prior art in calling for the light-shielding member to cover and extend past all sides of the drain electrode (metal thin film)

with a margin sufficient to block light incident on the metal thin film [answer, pages 3-5].

The examiner cites Murade as teaching a light shielding member that covers and extends over the source/drain region of a TFT to block incident light onto the source/drain region. The examiner also indicates that Murade's light-shielding member extends over the upper electrode of the storage capacitor [answer, pages 5 and 6]. The examiner finds that it would have been obvious to one of ordinary skill in the art at the time of the invention to extend the light-shielding film of the admitted prior art to cover the drain electrode and upper electrode of the storage capacitor to block incident light thereon to (1) minimize TFT leakage current; (2) improve display contrast; and (3) display high-quality images free from image-degrading effects, such as cross-talk [answer, page 6].

Regarding independent claims 1, 9, 11, and 19, appellants argue that Murade does not suggest that the metal thin film of the drain electrode of the TFT should be covered by the light-shielding layer with a margin sufficient to block light incident on the metal thin film as claimed [brief, page 8; emphasis in original]. Rather, appellants note that Murade only concerns shielding the semiconductor channel region and LDD regions of the TFT from incident light to minimize leakage current because light affects the electrical conductivity of semiconductor/polysilicon materials [brief, pages 8 and 9; reply brief, page 2]. Murade, however, is not concerned with shielding the claimed metal thin film

elements since incident light would not readily affect a metal's electrical conductivity [reply brief, page 2].

Appellants also note that the channel region in the admitted prior art is already covered by the light-shielding layer 11. Thus, Murade does not provide any suggestion or motivation to extend the light-shielding member of the admitted prior art with a margin sufficient to block light incident on the metal thin film of the TFT's drain electrode as claimed [brief, page 9].

Regarding independent claims 5, 9, 15, and 19, appellants argue that there is no metal film in Murade. Rather, Murade teaches shielding a non-metallic capacitance line 16 to prevent adverse effects due to incident light [brief, page 10; emphasis in original]. Appellants also argue that Murade fails to provide any motivation or suggestion to extend the light-shielding layer to cover the storage capacitor's metallic upper electrode since Murade, at best, only teaches shielding a structure formed of doped polysilicon material [brief, page 11]. According to appellants, Murade does not therefore provide a proper motivation to extend the light-shielding member into the pixel area with a margin sufficient to block light incident on the metal upper electrode of the storage capacitor as claimed [brief, pages 11 and 12; emphasis in original].

We will sustain the examiner's rejection of claims 1-3, 5-7, 9, 11-13, 15-17, and 19. At the outset, we agree with appellants that the examiner's rationale to extend the light-shielding member in the admitted prior art device is problematic essentially for the reasons noted by appellants. However, the teachings of

Murade considered alone amply establish at least a prima facie case of obviousness. In short, the examiner's reliance on the admitted prior art device to establish a prima facie case of obviousness is merely cumulative to the teachings of Murade. In our view, the obviousness rejection of claims 1-3, 5-7, 9, 11-13, 15-17, and 19 is proper based solely on the teachings of Murade.

Murade discloses a light-shielding member 6 that overlaps the TFT and covers the TFT's channel region 1c, LDD regions 1d, 1e, and source/drain regions 1a, 1b [Murade, Fig. 2]. As shown in Fig. 2, the light-shielding member 6 also overlaps the pixel electrode 14 including the junction between the drain region 1b and pixel electrode 14. In our view, at least the portion of pixel electrode 14 that directly contacts drain region 1b reasonably constitutes a "drain electrode" giving the term its broadest reasonable interpretation. Because this electrode is an ITO film according to col. 9, line 9, the drain electrode therefore is a metal thin film.

Although Murade teaches suppressing leakage current by preventing light from impinging on the various elements of the TFT as noted in col. 7, lines 54-60, we see no reason why light would also not impinge on the metallic drain electrode. In this regard, we note that Fig. 2 of Murade shows (1) the light-shielding member 6 directly overlapping the drain electrode, and (2) the light-shielding member 6 extending well beyond the drain electrode. Although Murade does not expressly discuss preventing light from impinging directly on the metallic drain electrode, the feature is nevertheless inherent to the structure

shown in Fig. 2. If a feature is inherent in the prior art, it is irrelevant that the prior art did not recognize such a feature or even if the feature was unknown. Toro Co. v. Deere & Co., 355 F.3d 1313, 1321, 69 USPQ2d 1584, 1590 (Fed. Cir. 2004) ("[T]he fact that a characteristic is a necessary feature or result of a prior-art embodiment...is enough for inherent anticipation, even if that fact was unknown at the time of the prior invention."). See also Atlas Powder Co. v. Ireco, Inc., 190 F.3d 1342, 1348-49, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999) (noting that it is irrelevant that the prior art does not recognize a key aspect of an invention if such an aspect is nevertheless inherent in the prior art).

Regarding the charging device, we agree with the examiner that the data line 3, scan line 2, and associated insulation together reasonably constitutes a storage capacitor as claimed [see answer, pages 5 and 6]. In addition, the capacitor's upper electrode (i.e., data line 3) is an aluminum film [Murade, col. 7, lines 28 and 29]. We see no reason why the light-shielding member 6 would not block incident light from impinging on the capacitor's upper electrode as claimed.¹ In particular, Fig. 2 of Murade shows (1) the light-shielding member 6 directly overlapping the upper electrode 3, and (2) the light-shielding member 6 extending well beyond the upper electrode in the vicinity of the capacitor.

Although Murade may not have discussed or even recognized the advantages of blocking incident light on the capacitor's upper electrode, such a recognition is

¹ Although insulative layer 15 is disposed between the light-shielding member 6 and the capacitor's upper electrode 3, the insulative layer 15 is a silicon oxide film (BPSG) which is a transparent material [see Murade, col. 12, lines 39-41]. Because such a transparent material would not block incident light, the presence of this intervening transparent layer does not affect the ability of light-shielding member 6 to block incident light on the capacitor's upper electrode.

irrelevant when the feature is nevertheless inherent to the prior art structure as noted previously. See Toro, 355 F.3d at 1321, 69 USPQ2d at 1590.

Although appellant argues that Murade suggests dispensing with the light-shielding member for metal capacitor electrodes [brief, page 11], we note this suggestion pertains to embodiments other than the first embodiment discussed above. In particular, the passages noted by appellants pertain to the second and fourth embodiments -- not to the first embodiment relied upon by the examiner and discussed above [see Murade, col. 14, line 63 - col. 15, line 5; col. 16, line 33 - col. 17, line 38].

Even though we find Murade anticipatory for the reasons noted above, obviousness rejections can nevertheless be based on references that happen to anticipate the claimed subject matter. In re Meyer, 599 F.2d 1026, 1031, 202 USPQ 175, 179 (CCPA 1979). Furthermore, in affirming a multiple-reference rejection under 35 U.S.C. § 103, the Board may rely on less than the total number of references relied on by the examiner. In re Bush, 296 F.2d 491, 496, 131 USPQ 263, 266- 67 (CCPA 1961); In re Boyer, 363 F.2d 455, 458 n.2, 150 USPQ 441, 444 n.2 (CCPA 1966). In short, the teachings of the admitted prior art relied upon by the examiner in establishing a prima facie case of obviousness are merely cumulative to the teachings of Murade. And, as we noted previously, Murade expressly and implicitly teaches all claimed limitations. Accordingly, we will sustain the examiner's obviousness rejection of independent claims 1, 5, 9, 11, 15, and 19 solely on the disclosure of Murade. Since appellants have not

separately argued the patentability of dependent claims 2, 3, 6, 7, 12, 13, 16, and 17, these claims fall with the independent claims. See In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987). See also 37 CFR § 41.37(c)(vii).

We now consider the rejection of claim 21 under 35 U.S.C. § 103(a) based on the admitted prior art in view of Murade and further in view of Yanagawa. We find that the examiner has established at least a prima facie case of obviousness of this claim that appellants have not persuasively rebutted. Here, the examiner has (1) pointed out the teachings of the admitted prior art and Murade, (2) pointed out the perceived differences between these references and the claimed invention, and (3) reasonably indicated how and why these references would have been modified to arrive at the claimed invention [answer, page 7]. Once the examiner has satisfied the burden of presenting a prima facie case of obviousness, the burden then shifts to appellants to present evidence or arguments that persuasively rebut the examiner's prima facie case. Appellants did not persuasively rebut the examiner's prima facie case of obviousness. Although we find that the teachings of the admitted prior art are merely cumulative to the teachings of Murade for the reasons noted previously, the examiner has nevertheless established a prima facie case of obviousness based solely on the teachings of Murade and Yanagawa. We will therefore sustain the examiner's obviousness rejection of claim 21 based on Murade and Yanagawa.

In summary, we have sustained the examiner's rejection with respect to all claims on appeal. Therefore, the decision of the examiner rejecting claims 1-3, 5-7, 9, 11-13, 15-17, 19, and 21 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

Gerry Smith
JERRY SMITH

JERRY SMITH
Administrative Patent Judge

~~LANCE LEONARD BARRY~~
~~Administrative Patent Judge~~

MAHSHID D. SAADAT
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